

# Snake and Columbia River Fish Passage

**Derek Fryer**

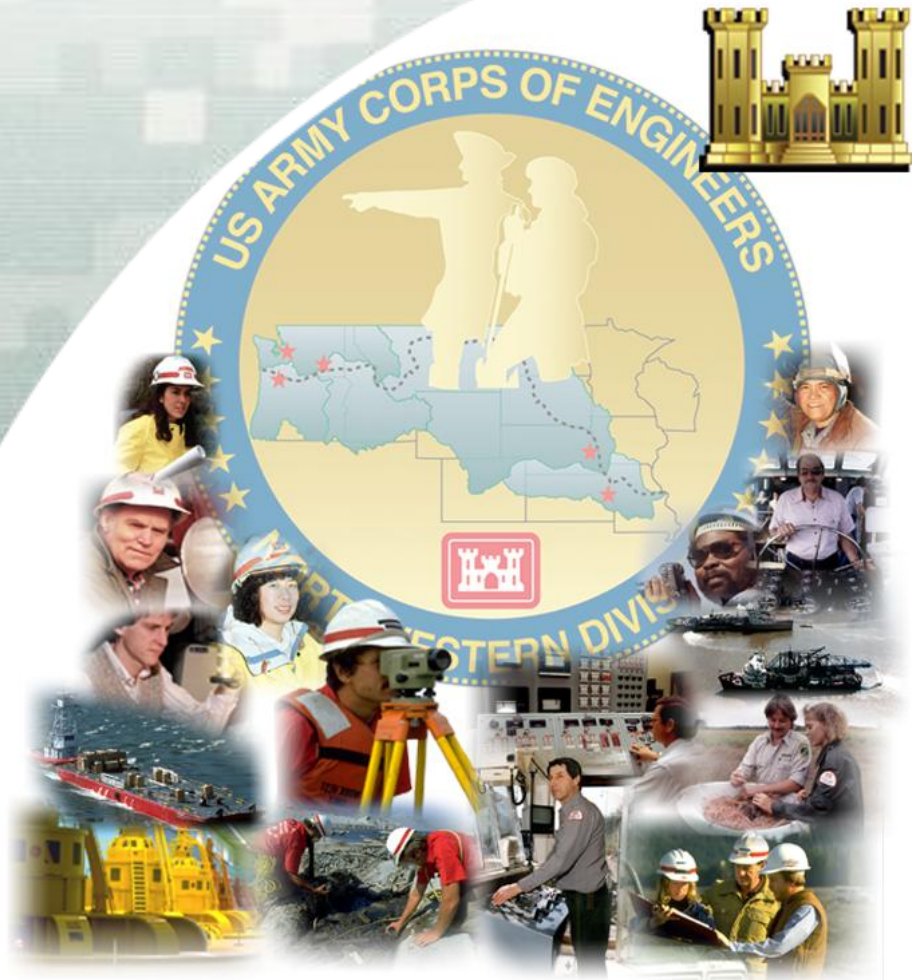
Anadromous Fish Evaluation  
Program Coordinator

Walla Walla District

April 1, 2015



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# Snake and Columbia River Fish Passage

- Outline for today
  - ▶ Brief Overview of CRFM and AFEP
  - ▶ Walla Walla District Dams
  - ▶ Overview of the Snake and Columbia Rivers fish passage studies
    - Adult Salmonid passage evaluations
    - Juvenile Salmonid passage evaluations
    - Pacific Lamprey passage designs and evaluations.



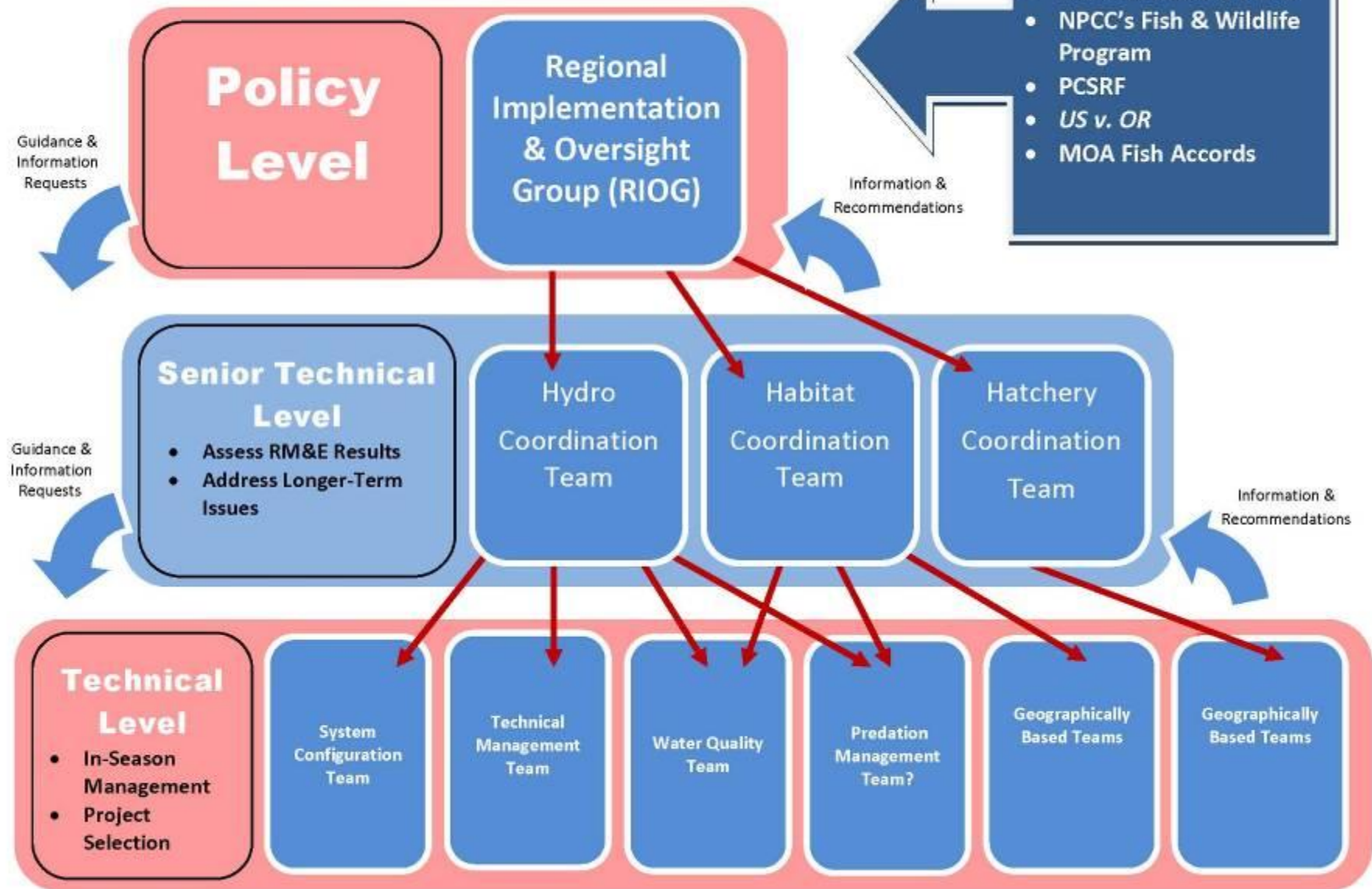
# 2008-2018 FCRPS BiOp Coordination

- Operating within BiOp parameters to achieve BiOp Performance Standards
- As appropriate, independent science review (ISRP, ISAB)

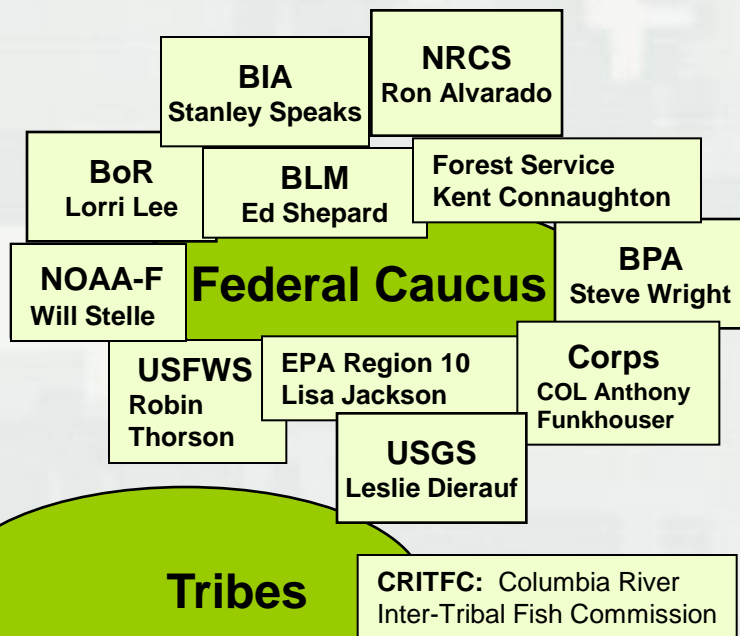
## FCRPS BiOp

### Other Programs:

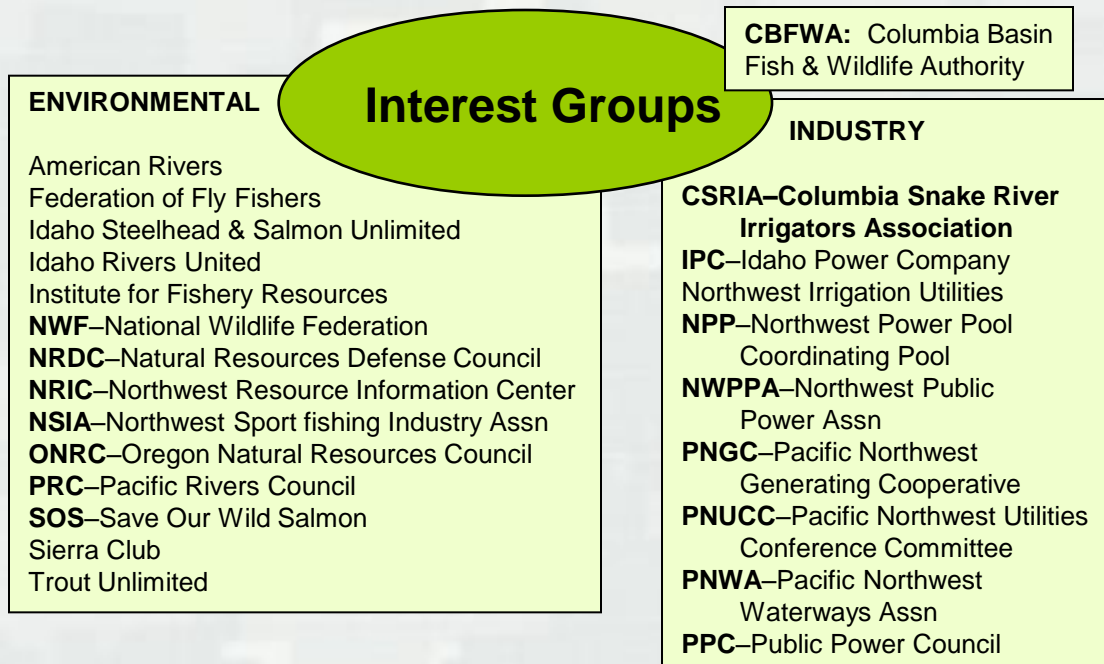
- NOAA Recovery Plans
- NPCC's Fish & Wildlife Program
- PCSRF
- *US v. OR*
- MOA Fish Accords







Burns Paiute Indian Colony  
 Coeur D'Alene Tribe of the Coeur D'Alene Res  
 Confederated Salish and Kootenai Tribes of the Flathead Res  
 Confederated Tribes and Bands of the Yakama Nation  
 Confederated Tribes of the Colville Res  
 Confederated Tribes of the Umatilla Indian Res  
 Confederated Tribes of the Warm Springs Res  
 Kalispel Indian Community of the Kalispel Res  
 Kootenai Tribe of Idaho  
 Nez Perce Tribe of Idaho  
 Shoshone/Bannock Tribes of the Fort Hall Res  
 Shoshone-Paiute Tribes of the Duck Valley Res  
 Spokane Tribe of the Spokane Res



# Regional Coordination



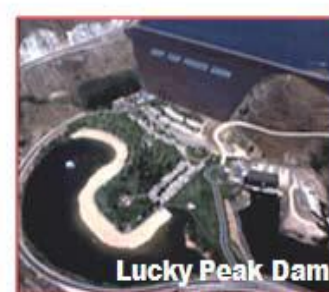
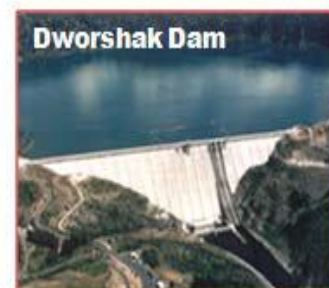
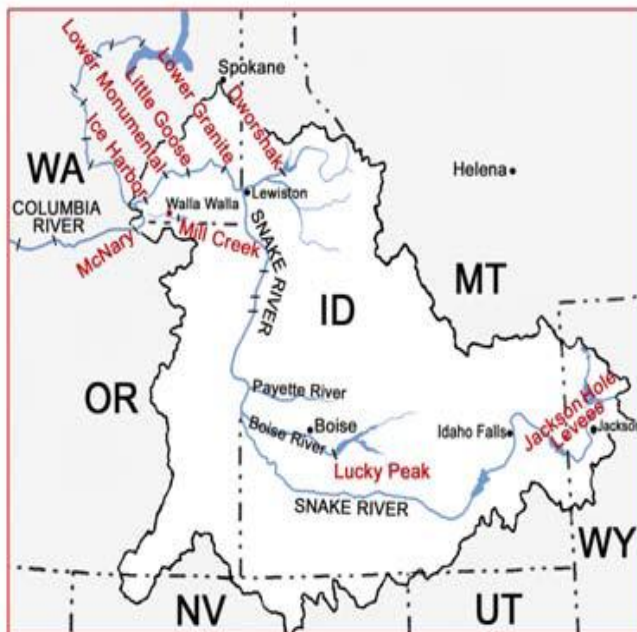
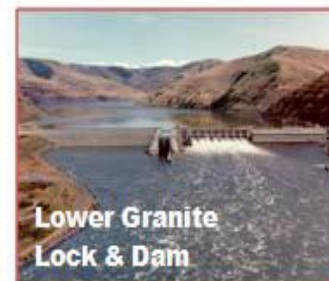
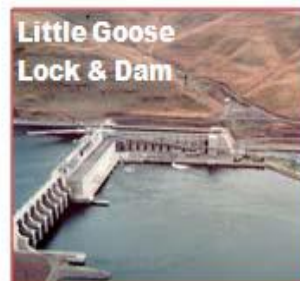
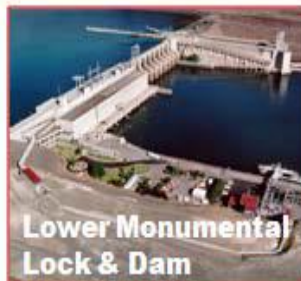
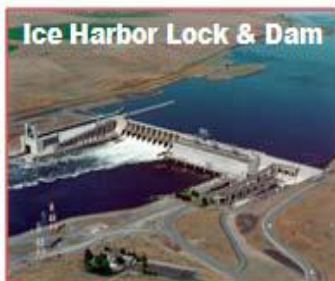
Idaho Dept of Fish & Game  
 Oregon Dept of Fish & Wildlife  
 Washington Dept of Fish & Wildlife  
 Montana Dept of Fish, Wildlife & Parks



Bruce Measure, MT  
 Rhonda Whiting, MT  
 Joan Dukes, OR  
 Bill Bradbury, OR  
 Tom Karier, WA,  
 Phil Rockefeller, WA  
 Bill Booth, ID  
 Jim Yost, ID



# WALLA WALLA DISTRICT OVERVIEW



# Columbia River Basin





# Anadromous Fish Evaluation Program

- Adult Fish Passage
  - ▶ Dam Passage
  - ▶ Conversion Rates
  - ▶ Steelhead Overwintering
  - ▶ Straying
- Juvenile Fish Passage
  - ▶ Dam Survival Studies
  - ▶ Turbine Passage
- Juvenile Fish Transport
- Predation
  - ▶ Estuary Avian Predation
  - ▶ Inland Avian Predation



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# Adult Passage at Dams



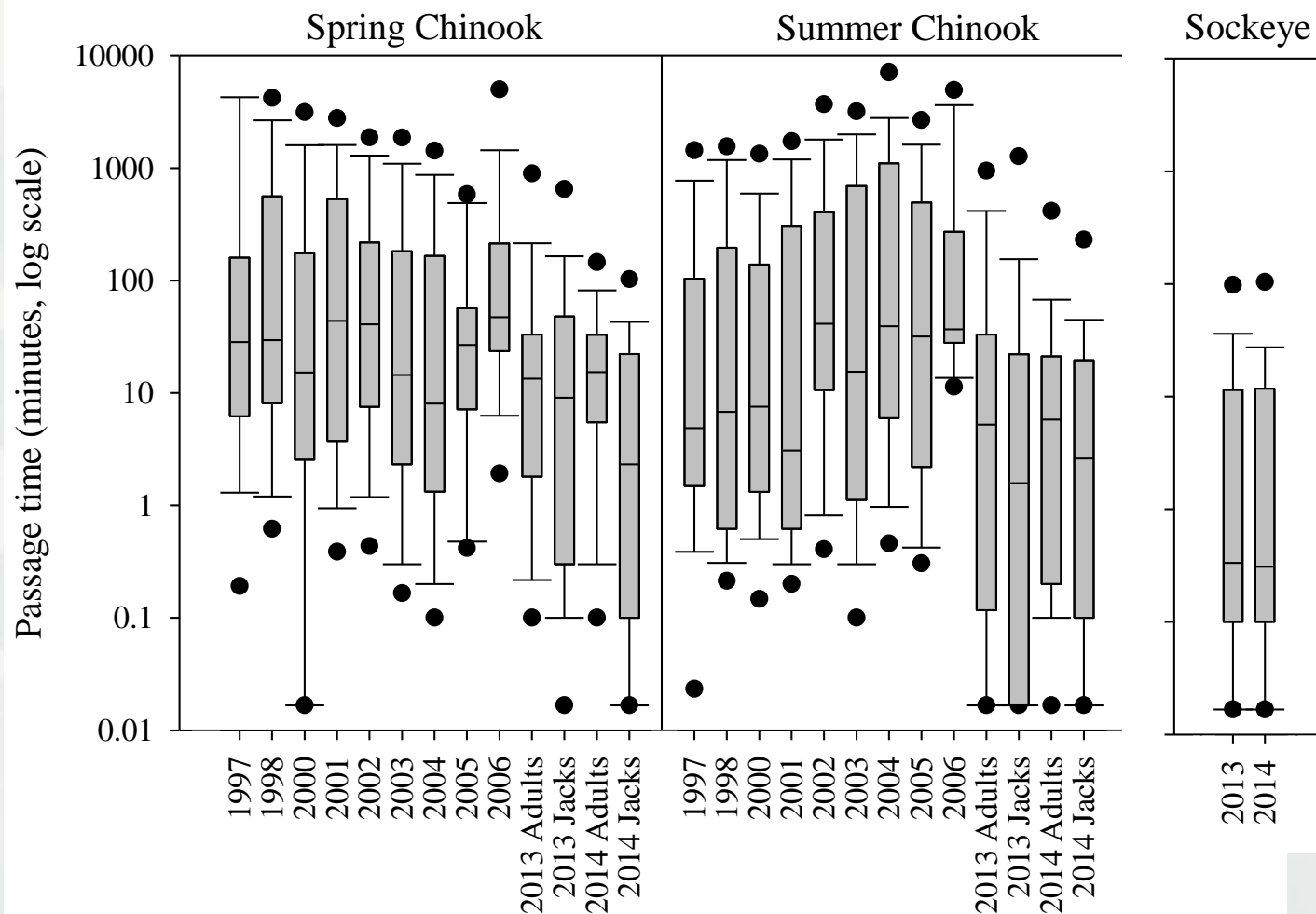


# Adult Passage - John Day North Ladder Improvements



# Adult Passage at Dams

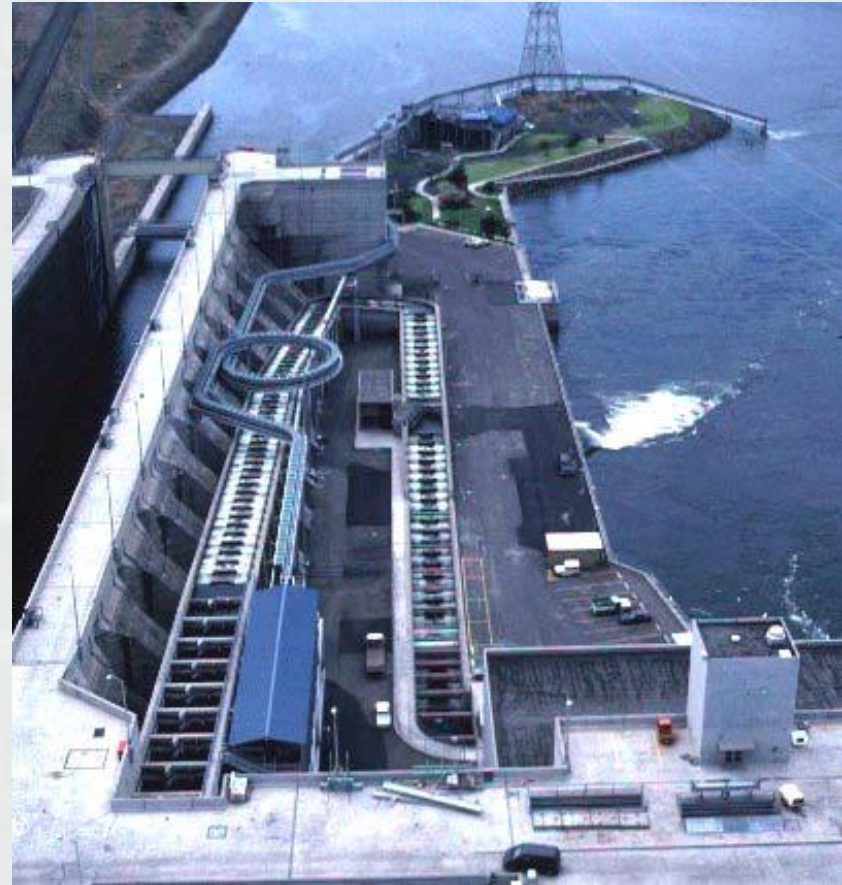
JD-North passage time: first approach to first entry



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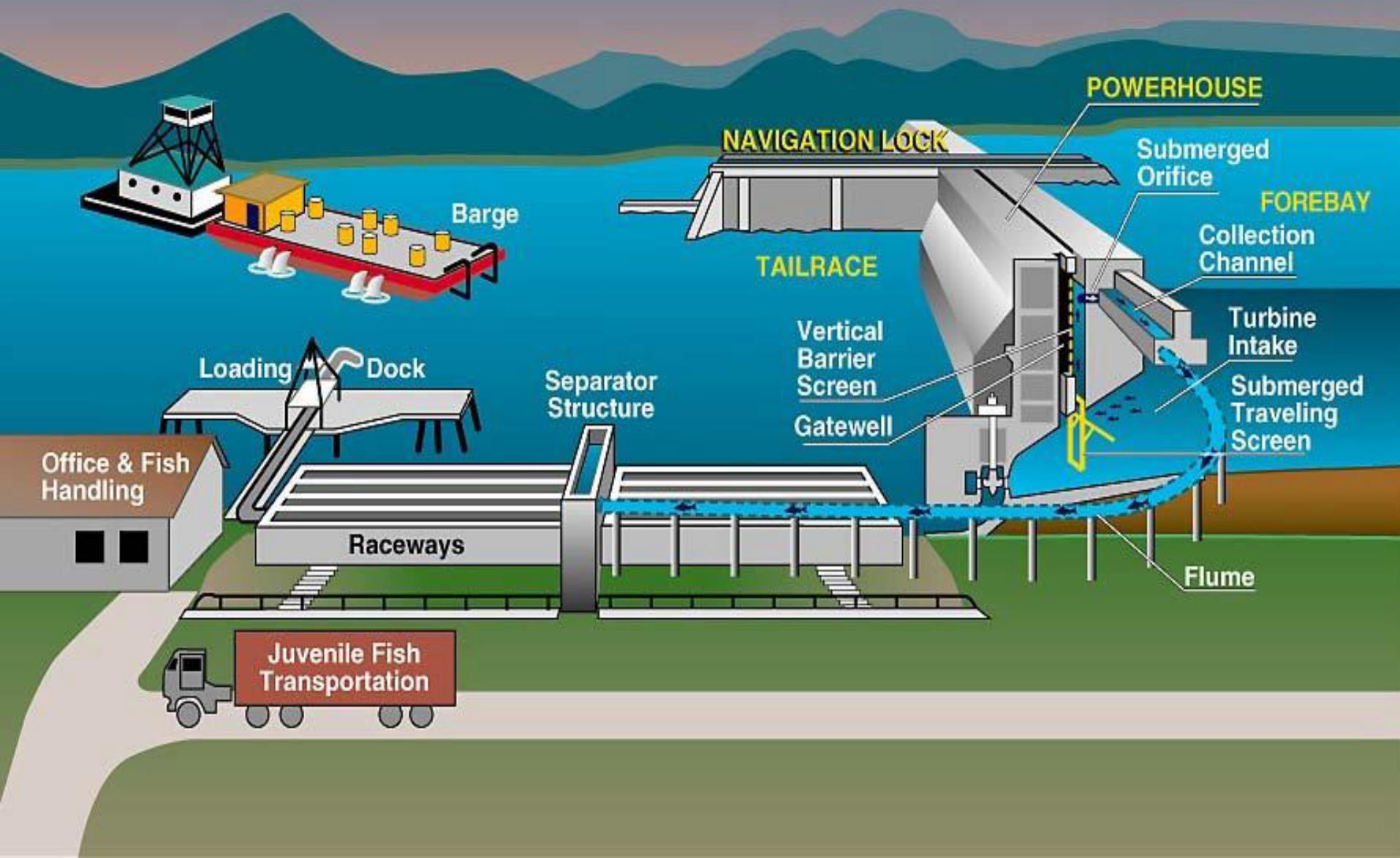


# JUVENILE FISH PASSAGE AT DAMS



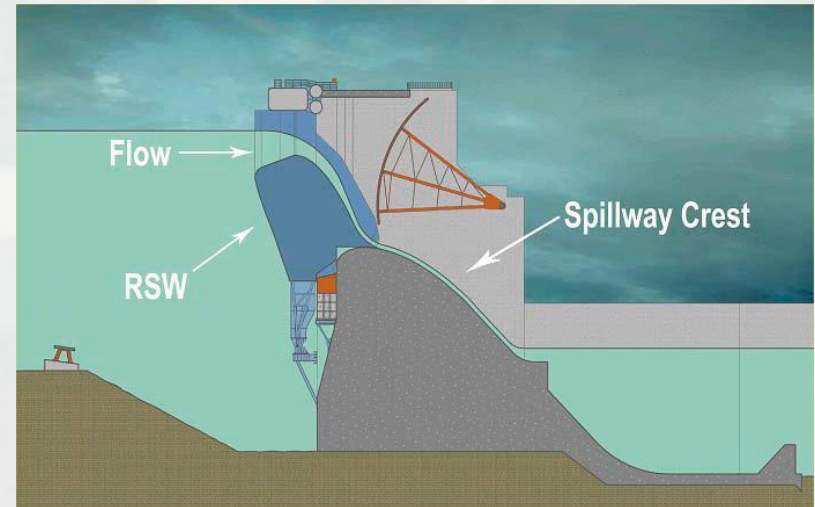
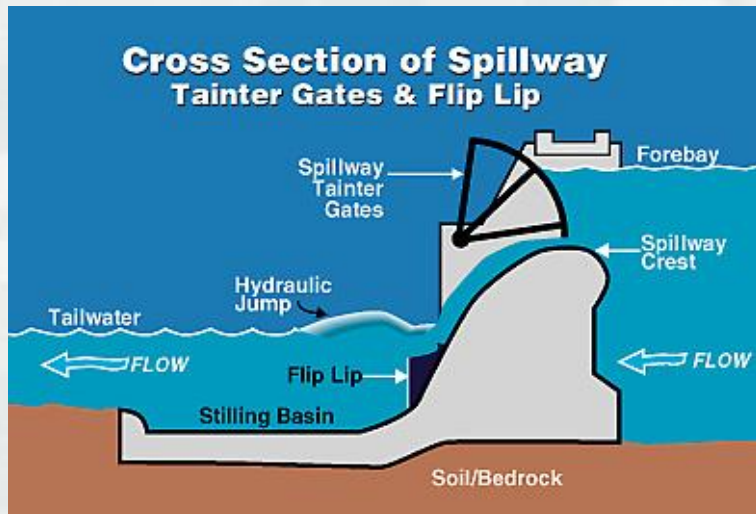
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# Juvenile Fish Collection System





# SPILLWAY PASSAGE



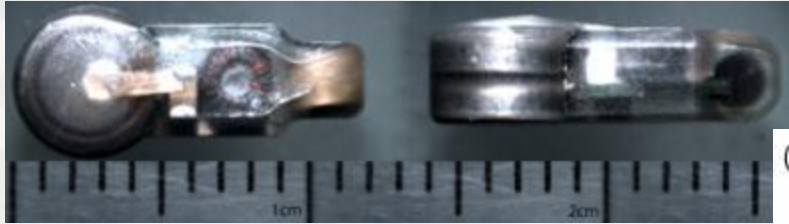
# Juvenile Salmon & Steelhead BiOp Performance Evaluations

- ▶ BiOp Targets include survival and final project (Dam) configuration
  - BiOp Target 96% Spring and 93% Summer
  - Prescribed spill operations to create favorable survival conditions for juvenile fish.
  - Many metrics involved (route survival, FPE, FGE, SPE, etc...)
- ▶ BiOp Targets include survival and final project (Dam) configuration
  - 36 studies conducted so far
    - ▷ 27/36 meeting objectives
    - ▷ 9/36 Slightly missing objectives





# Juvenile Salmon Acoustic Telemetry System (JSATS) Components



# Subyearling Chinook 2013

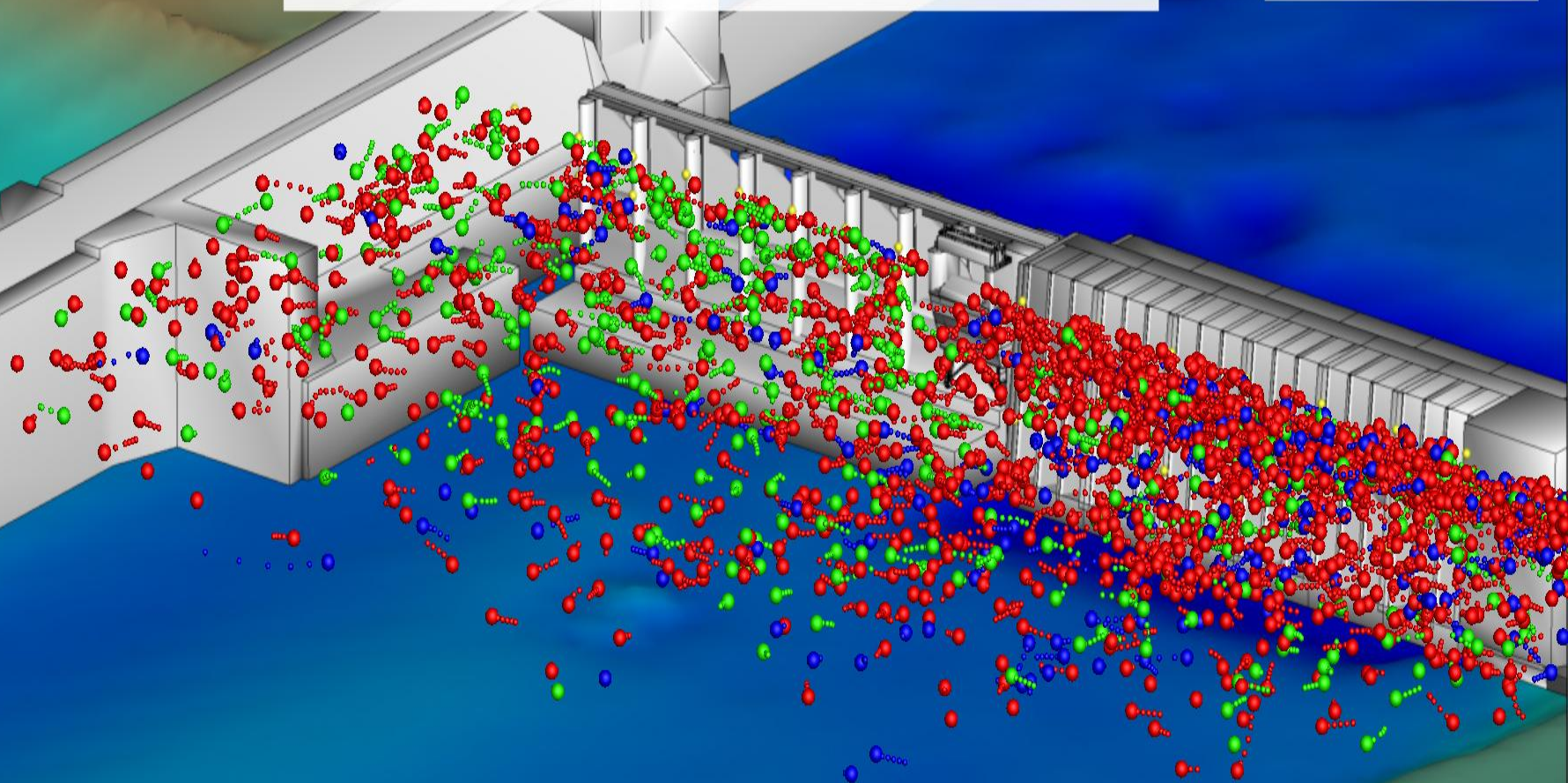
JSATS 3D Tracks - Lower Monumental Dam Forebay

1 hour total time; 5 seconds per frame; 30 fps

Tracks colored by where passage occurred

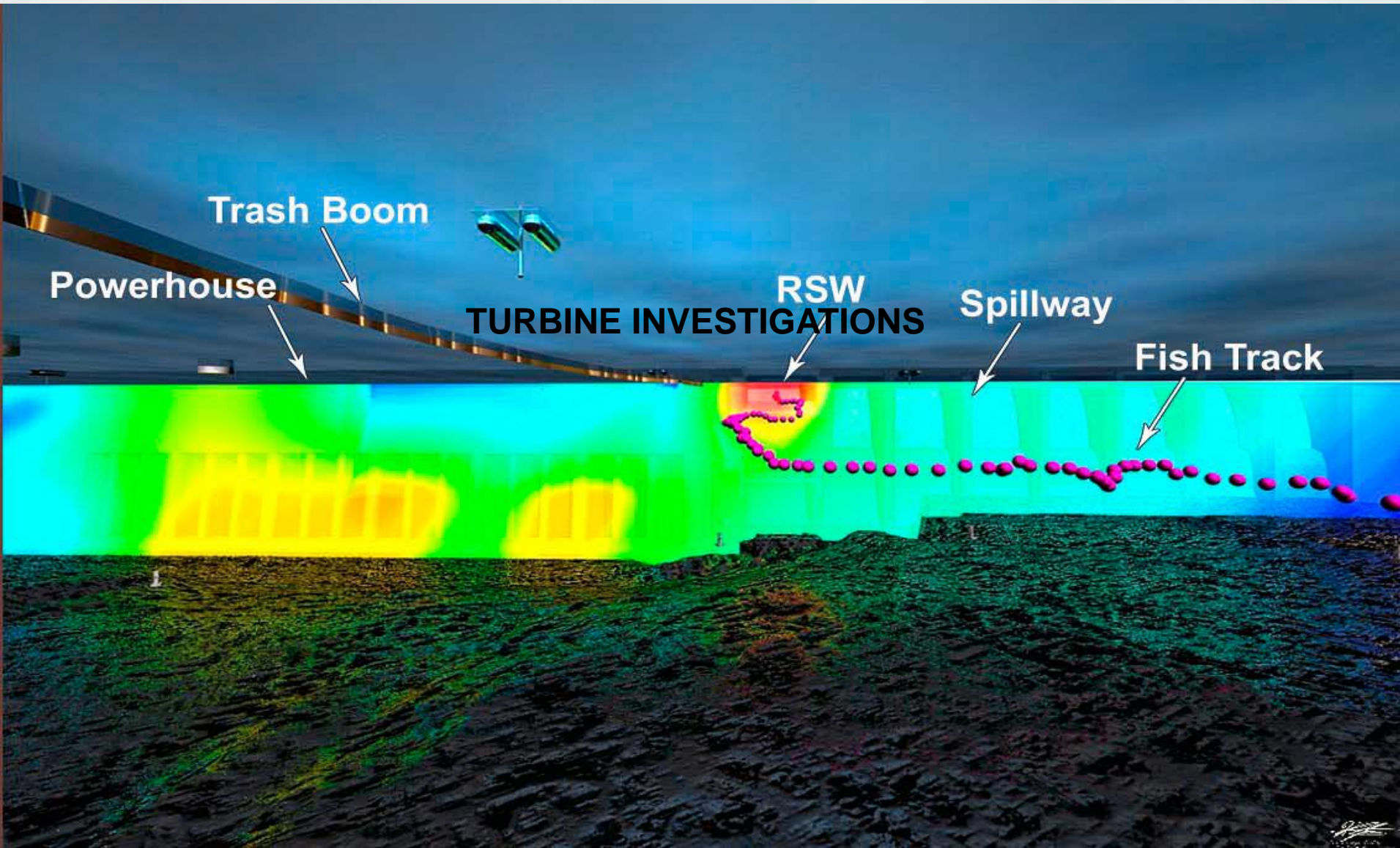
## Legend

- Spillway
- Powerhouse
- RSW





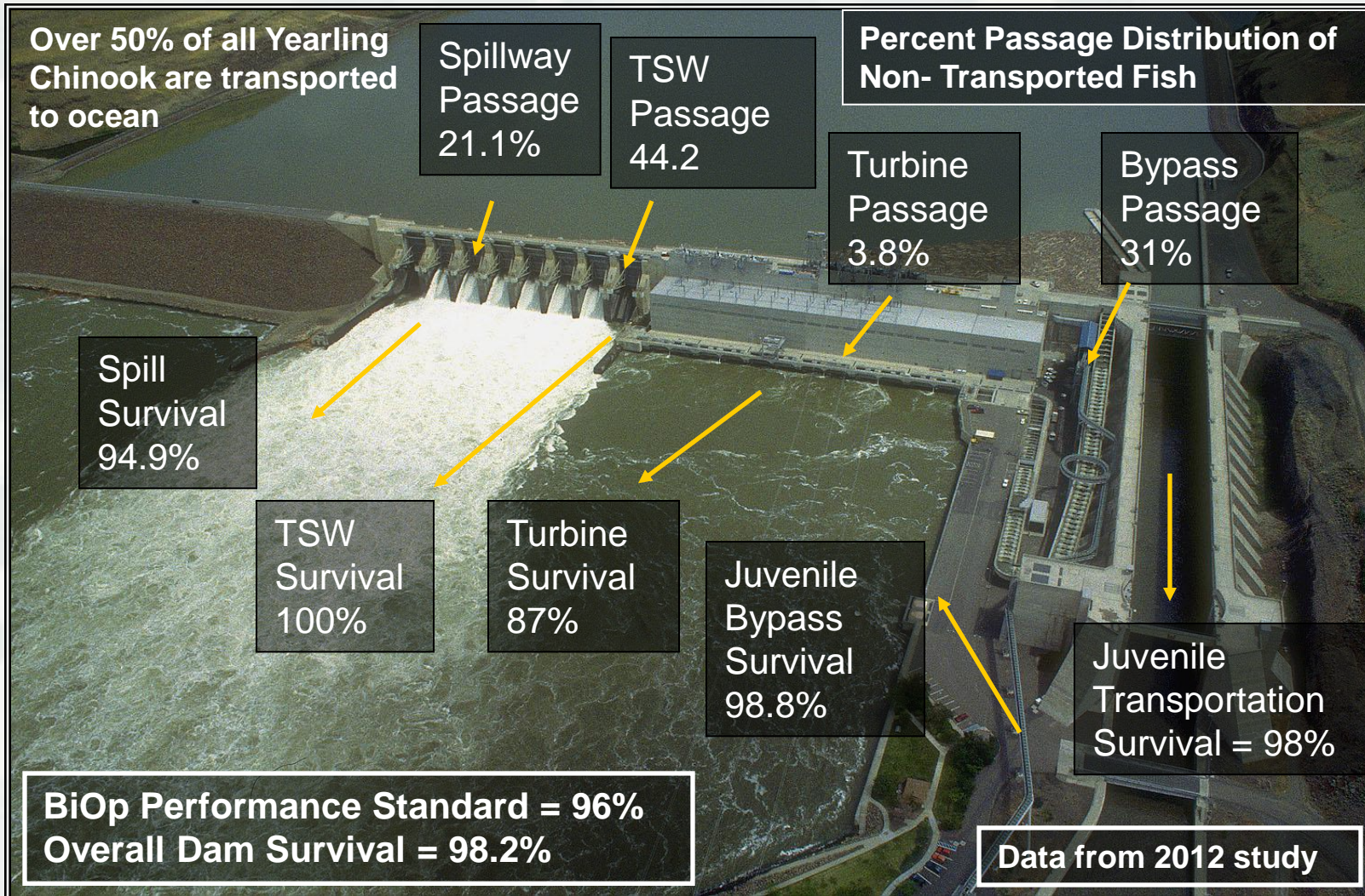
# CORRELATION FISH BEHAVIOR / HYDRAULICS





# Little Goose Dam

## Yearling Chinook Passage & Survival Estimates



# TURBINE DEVELOPMENT

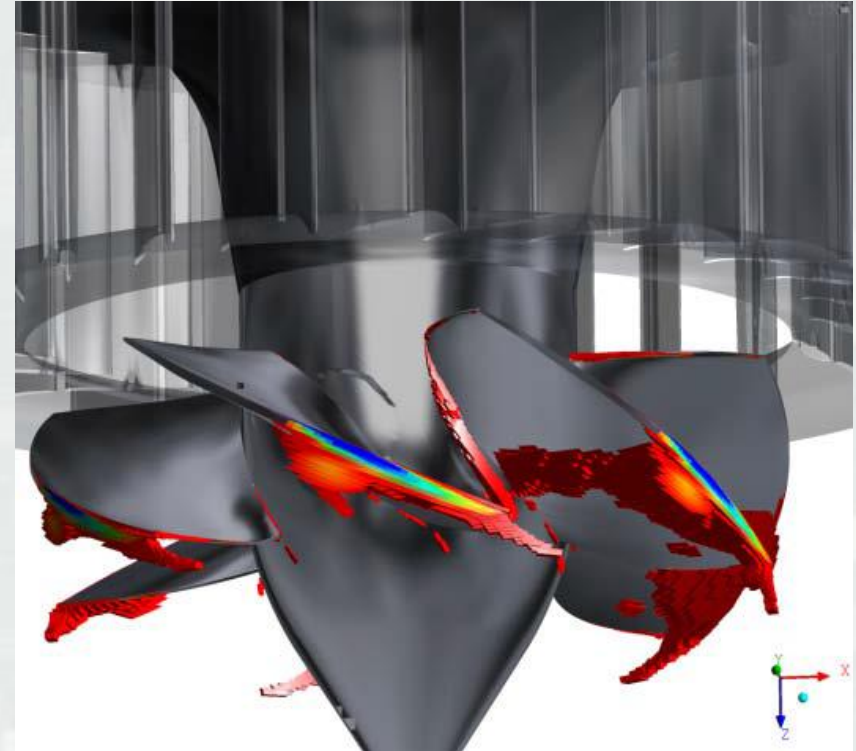
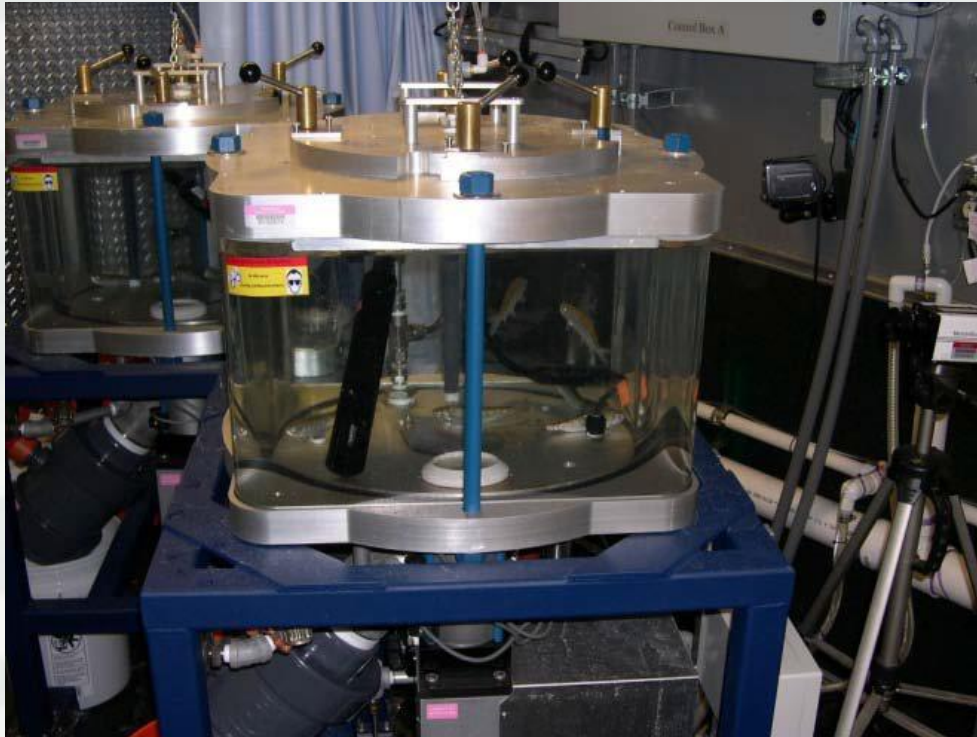
- **Turbine Survival Program (TSP)** Improve our understanding of the turbine environment.
  - ▶ Improve turbine operations for safer fish passage.
  - ▶ Develop turbine design features and criteria for safe fish passage.
- **•Ice Harbor FCRPS Test Turbine** Collaborative design effort with a turbine manufacture to design and test a fish friendly turbine unit at IHR.
  - ▶ Building on lessons learned from the TSP and McNary Modernization efforts.



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# TURBINE INVESTIGATIONS



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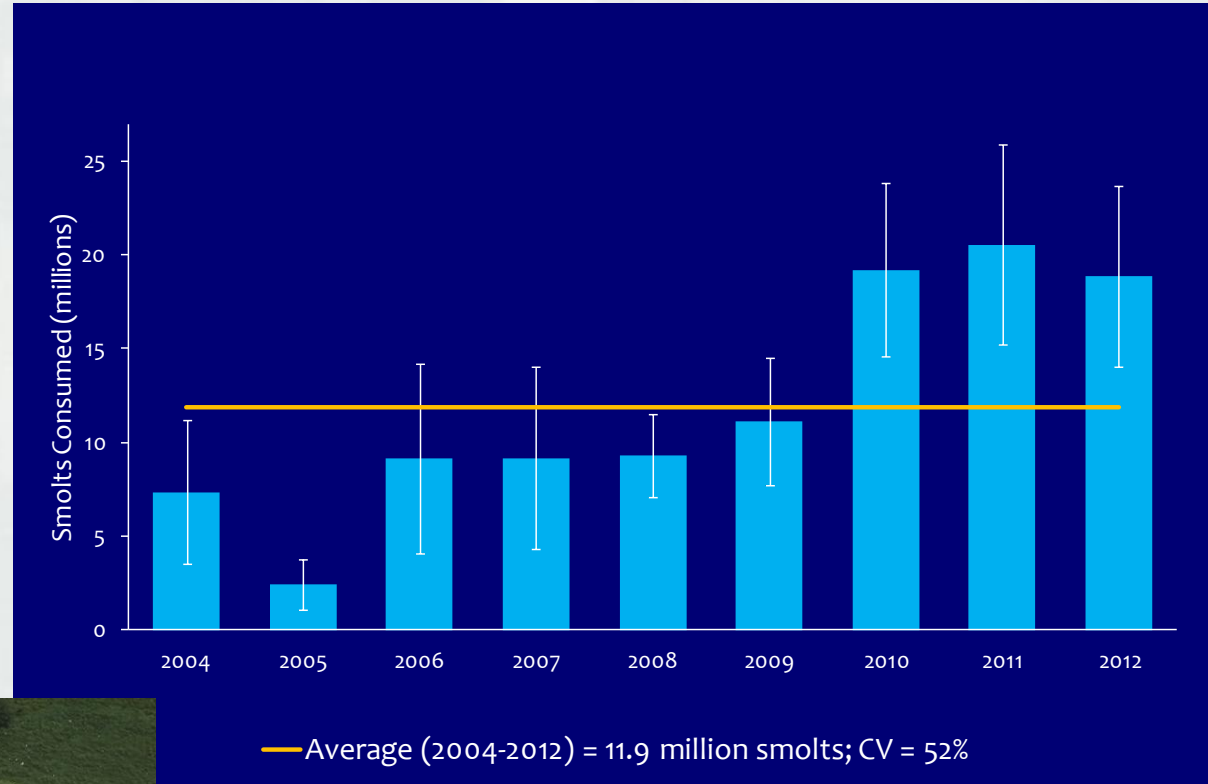
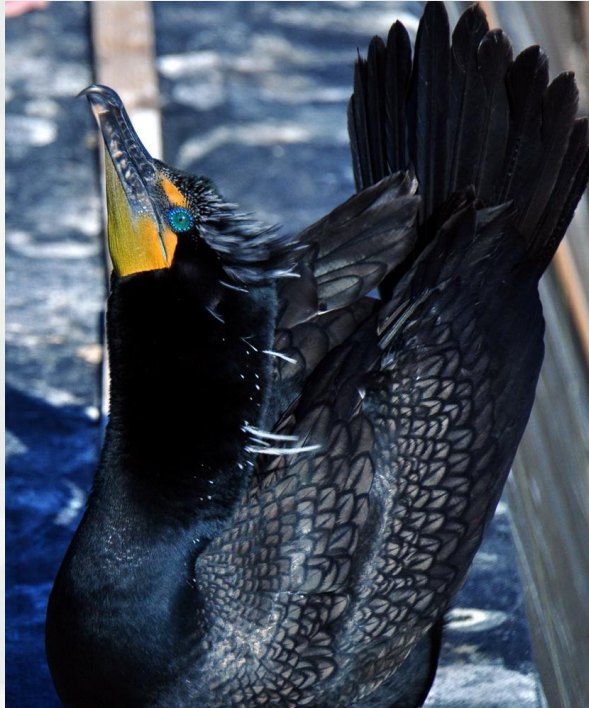


# Juvenile Fish Transport



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# East Sand Island Double-crested Cormorant Annual Smolt Consumption

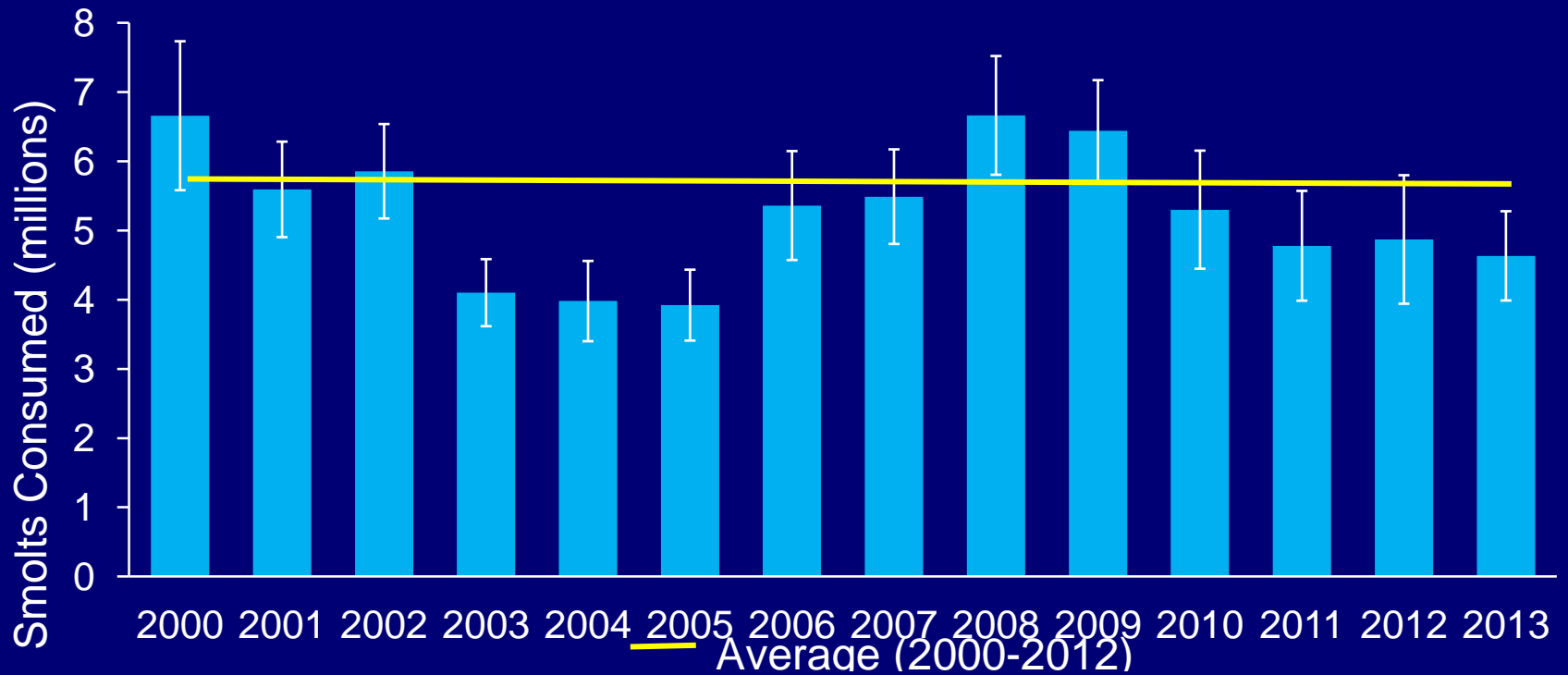


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# Avian Predation

## Smolt Consumption





# Inland Avian Predation

- Inland Avian Predation Management Plan completed (Jan 2014)
- Implementation of IAPMP by Reclamation began at Goose Island (Feb 2014)
- Adaptive Mgmt monitoring on Columbia Plateau conducted during 2014 by Corps and Reclamation
  - ▶ Goose Island tern colony size effectively reduced in 2014; total Columbia Plateau tern nesting counts remained relatively stable; expect further reductions in 2015
- IAPMP entered Phase 2
  - ▶ Habitat Enhancement efforts at Don Edwards NWR (San Francisco Bay) initiated in 2014 and to be complete prior to 2015 season
  - ▶ Preparations for dissuasion of Caspian tern colony during 2015 at Crescent Island initiated
  - ▶ Preparations for additional dissuasion efforts at Goose Island tern colony during 2015 coordinated with Reclamation

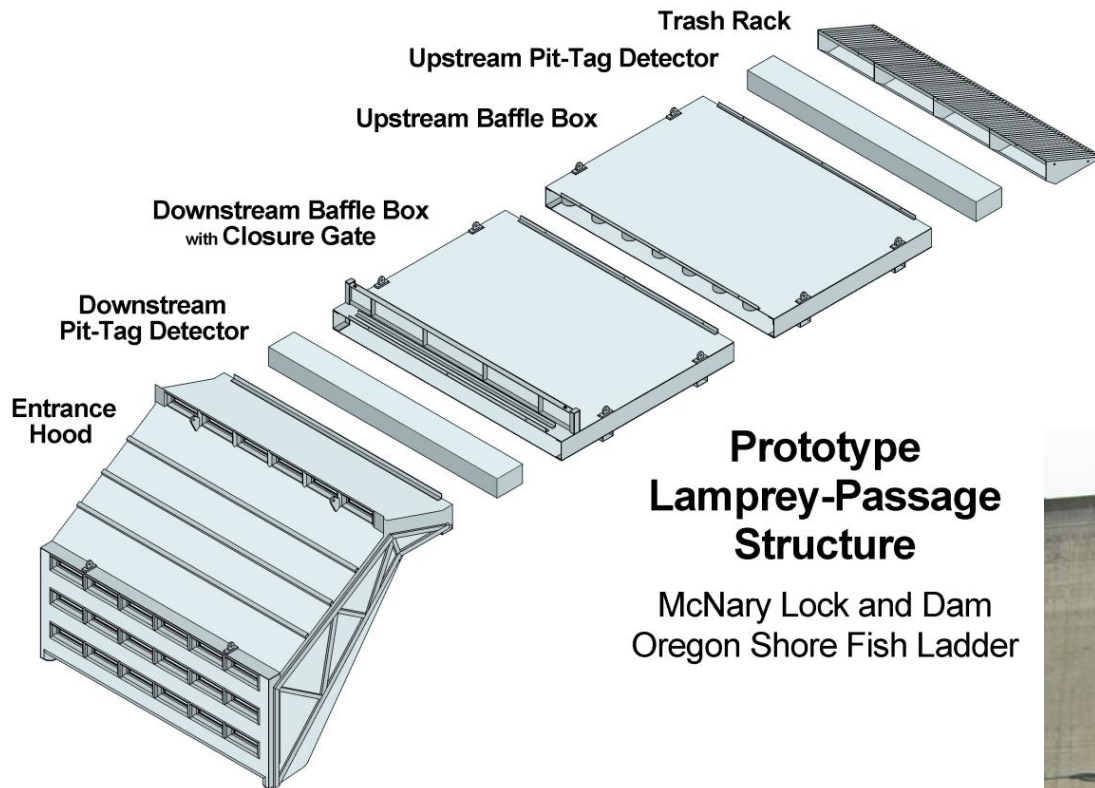


# Pacific Lamprey Passage



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# Pacific Lamprey – McNary Dam







Bollards

